PATENT APPLICATION

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UNIVERSAL SUPPORTIVE SUSPENSION POLE

RELATED APPLICATIONS

This application is a Continuation In Part (CIP) of U.S. application Ser. No. 10/409,465, filed April 7, 2003, the contents of said application are hereby incorporated herein by reference.

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UNIVERSAL SUPPORTIVE SUSPENSION POLE

FIELD OF THE INVENTION

[0001] The invention is directed to a low cost, simplified universal supportive suspension pole. More particularly, and by way of example and not limitation, the invention is directed to a supportive pole, having spring suspension, for use in construction environments to buttresses material for draping across rooms, doorways and the like for protecting surfaces and objects from debris, and to buttresses bricks, tile, stone, drywall for curing, setting and fixing to overhead surfaces, and to buttresses temporary walls when nails and glue cannot be used, where the universal supportive suspension pole has simplified construction to reduce the manufacturing time and material costs and is affordable to the average consumer.

BACKGROUND

[0002] It is desirable in some commercial and residential construction environments, such as new building construction or interior remodeling, to protect walls, stairs, doorways, rooms and objects from potential damage, in a simple and affordable manner. It is further desirable in some construction environments to support bricks, stones, drywall and other objects to inverted surfaces for securing or holding while a bonding agent cures. Additionally, it is desirable in some construction environments to support temporary walls and doors when adhesives and nails are not suitable for supporting a temporary wall.

[0003] In common practice, barrier sheeting is supported for shielding objects from dust and debris caused by construction activities. Some methods of supporting barrier sheeting include taping, gluing and stapling to walls, fixtures and objects. These techniques, though low cost, are time consuming to use and often times

impact the attachment structure by leaving adhesive residue or holes. Another method of supporting barrier sheeting uses an elaborate pole mechanism having a spring loaded feature comprising a piston, cylinder, and a spring assembly made from numerous specialty parts using expensive fabrication techniques, such as molding and machining. See, for example Whittemore (U. S. Pat. No. 6,508,295). Though these devices are effective in supporting barrier sheeting, they are expensive to buy and difficult to manufacture. The cost of manufacturing these elaborate pole mechanisms includes expensive molds for injection molding and complicated assembly processes which contribute to an expensive product to the consumer.

[0004] When it is desirable to secure bricks, stones, drywall and other objects overhead using bonding or adhesive methods, in common practice, objects are supported for securing using cumbersome scaffolding techniques or manual labor to hold an object in place until the bonding material has sufficiently cured.

[0005] Often times a temporary wall must be supported when nails and adhesives are not desirable, for example when a door has been removed from a doorway surrounded with ornamental trim, in common practice, a host of objects are rested against a temporary wall to hold the wall against the doorway.

[0006] What is needed is a low cost, simple universal supportive pole, with suspension operation, that is easy to make and use. The present invention was developed in an effort to provide an effective low cost, simple universal supportive pole with suspension operation that is easy to make and use.

DESCRIPTION OF THE DRAWINGS

[0007] Fig. 1 is a perspective view illustrating a universal supportive suspension pole.

[0008] Fig. 2 depicts the components of a universal supportive suspension pole.

[0009] Fig. 3a is an exploded perspective view of the suspension of the universal supportive suspension pole.

[0010] Fig. 3b is a front view of the suspension fastened to the housing pole of the universal supportive suspension pole.

[0011] Fig. 3c is a front view of the suspension fastened to the top pole of the universal supportive suspension pole.

[0012] Fig 3d is an alternate embodiment of a barbed cylinder insert.

[0013] Fig. 4a is a perspective view of the pivotal top assembly attached to the top pole of the universal supportive suspension pole.

[0014] Fig 4b is an exploded perspective view of the pivotal top assembly attached to the top pole of the universal supportive suspension pole.

[0015] Fig. 5 is an exploded perspective view of the base pole locking mechanism of the universal supportive suspension pole.

[0016] Figs. 6a, 6b and 6c are depictions of how to use the universal support suspension pole with barrier sheeting.

[0017] Fig. 7a is a front view of the universal support suspension pole used with setting bricks.

[0018] Fig. 7b is an oblique view of the universal support suspension pole used with a temporary wall.

[0019] Fig. 8a is a perspective view of the universal support suspension pole insert tube spool cleaved upon insertion to a compression spring.

[0020] **Fig. 8b is a top view of the universal support suspension pole insert tube spool having a cleave angle.**

[0021] **Fig. 9a is a side view of the suspension spring subassembly having first and second tubular inserts and a compression spring.**

[0022] **Fig. 9b and 9c depicts a top pole being coupled with a suspension spring sub-assembly.**

[0023] **Fig. 9d and 9e depict a housing pole being coupled with a suspension sub-assembly.**

[0024] **Fig. 10a and 10b depict a front-end view of the top pole being assembled to a suspension spring sub-assembly.**

[0025] **Fig. 10c and 10d depict a back-end view of the housing pole being assembled to a suspension spring sub-assembly.**

DETAILED DESCRIPTION

[0026] In accordance with the present invention a universal support suspension pole comprises a hollow housing pole about 8 feet long. The housing pole has a first end for slideably receiving a first end of a hollow base pole about 6 feet long. The housing pole has a second end for slideably receiving a first end of a hollow top pole about 2 feet long.

[0027] Fixedly attached to the first end of the base pole is a locking mechanism for enabling selective holding of the base pole to the housing pole. The base pole has a second end for coupling to a base foot, wherein the base foot has a first end for fixedly attaching to the second end of the base pole and has a second end for frictionally buttressing a floor or ground surface. The base foot is weighted to

facilitate sliding action as the housing pole is raised vertically with the locking mechanism disengaged from the housing pole.

[0028] The top pole is slideably and elastically coupled at its first end to the housing pole second end using a spring assembly. The top pole has a second end for fixedly coupling to a first end of a pivotal attachment, wherein the pivotal attachment has a second end for frictionally buttressing overhead, vertical and angled surfaces.

[0029] The spring assembly elastically and slideably couples the top pole to the housing pole for enabling spring action therein. The spring assembly comprises a first hollow tubular insert for fixedly inserting into a first end of a compression spring about 2 inches, and further comprises a second hollow tubular insert for fixedly inserting into a second end of the compression spring about 2 inches.

[0030] The tubular insert is about a 2 inch long segment of plastic tubing, of about a half inch outside diameter, and having cleaved ends at an angle between 10 degrees and 30 degrees, wherein the cleaved angle enables easier insertion into the compression spring. The tubular insert is cleaved from a bulk spool of tubing. The tubular insert has an outside diameter that creates a tight frictional fit when inserted into the inside diameter of the compression spring. The spring assembly further comprises a first securing mechanism for fixedly attaching the first tubular insert, having a transverse hole about 1 and a half inches from its first end, to the top pole wherein the top pole has a transverse hole about 1 and a half inches from its first end for receiving the first securing mechanism. The first securing mechanism is inserted through the top pole transverse hole and further inserted between two winds of the compression spring and further inserted through the tubular insert transverse hole whereby the securing mechanism is fixedly fastened therein. The securing

mechanism is a rivet having an outside diameter suitable for inserting into a hole made through the top pole and through to the first tubular insert center.

[0031] The top pole transverse hole and first tubular insert transverse hole are created by positioning the first tubular insert, being frictionally placed inside the compression spring first end, about 2 inches inside the top pole first end. A transverse hole is made by drilling through the housing pole and tubular insert to a concentric center of the tubular insert and top pole. Further, the hole is made between two winds of the compression spring, coiled about the tubular insert, where the rivet diameter is suitable to create a frictional fit with the compression spring coils.

[0032] The spring assembly further comprises a second securing mechanism for fixedly attaching a second tubular insert, having a first end, a second end and a transverse hole about 1 and a half inches from its first end, to the housing pole wherein the housing pole has a transverse hole about 9 and a half inches from its first end for receiving the second securing mechanism. The second securing mechanism is inserted through the top pole transverse hole and further inserted between two winds of the compression spring and further inserted through the second tubular insert's transverse hole whereby the second securing mechanism is fixedly fastened therein. The second securing mechanism is a rivet having an outside diameter suitable for inserting into a hole made through the housing pole and through to the second tubular insert center.

[0033] The housing pole transverse hole and second tubular insert transverse hole are created by positioning the second tubular insert, being frictionally placed inside the compression spring second end, about 10 inches inside the housing pole second end. A transverse hole is made by drilling through the housing pole and tubular insert to a concentric center of the tubular insert and housing pole. Further,

the transverse hole is made between two winds of the compression spring coiled about the second tubular insert, where the rivet diameter is suitable to create a frictional fit with the compression spring coils.

[0034] The compression spring is about 8 inches long and about 5/8 inches in outside diameter with an inside diameter of about a half inch. The compression spring outside diameter is suitable for slidably inserting into the first end of the top pole. The wind separation between compression spring coils is less than the diameter of the rivet cylinder such that the rivet is frictionally held between the spring coils when the rivet is operated to its fixed state.

[0035] The universal support suspension pole comprising a hollow housing pole having a first end for slideably receiving a first end of a hollow base pole, and having at a second end for slideably and elastically receiving a first end of a hollow top pole, wherein the base pole has second end for coupling to a base foot, and wherein the top pole has a second end for coupling to a pivotal attachment, and having the steps of manufacturing comprising rotating a compression spring about its central axis in a direction that induces the compression spring to expand about a first plastic hollow tube end when inserted into the first end of the compression spring, wherein the first plastic tube, having an angled first end, is inserted into the spring about 2 inches. The tubular insert is drawn from a bulk spool of tubular insert material. The first plastic tube is cleaved from the spool of tubing at an angle between 10 degrees and 30 degrees near the first end of the spring, wherein the cleaved angled end enables easier insertion into the compression spring. The compression spring is then rotated about its central longitudinal axis in a direction that induces the second end of the compression spring to expand about a second plastic tube when inserted into a second end of the compression spring, wherein the second plastic tube, having an angled cleaved end, is inserted about 2 inches into the spring. The second plastic

tube insert is cleaved at an angle between 10 degrees and 30 degrees near the second end of the compression spring.

[0036] The spring assembly is coupled to the top pole, where the first compression spring end, having the first tubular insert frictionally inserted therein, is positioned and fixedly held about 2 inches into the first end of a hollow top pole and fixedly held for drilling a transverse hole about a one and a half inches from the first end of the top pole, through the top pole wall and between two coils of the compression spring and through the first plastic insert tube to the concentric center, where the drilled transverse hole is for receiving a first fastening rivet. The first rivet is inserted through the top pole drill transverse hole and between the spring coils and into the tubular insert transverse hole, whereby the rivet is then actuated for fixedly fastening the first tubular insert to the top pole.

[0037] Further, the spring subassembly is coupled to the housing pole by inserting the second compression spring end, having the second tubular insert frictionally positioned therein, into the second end of the housing pole about 10 inches from the housing pole second end. The inserted compression spring second end is held in place for drilling a transverse hole, for receiving a second fastening rivet, through the housing pole about 9 and a half inches from the second end of the housing pole, where the transverse hole is drilled through the housing pole wall and between two compression spring coils and through the tubular insert to the concentric center. The second fastening rivet is inserted through the transverse drill hole and between the spring coils and into the tubular insert transverse hole, whereby the second rivet is then actuated for fixedly fastening the second tubular insert to the housing pole.

[0038] Referring now to the drawings, Fig. 1 is a perspective view of universal supportive suspension pole 100 having a housing pole 102, a top pole 104, a base

pole 106, a base foot 108 and a pivotal top 110. Fig. 2 depicts components 200 comprising universal supportive suspension pole 100 of Fig. 1. Fig. 3a is an exploded perspective view of pole suspension 300 of universal supportive suspension pole 100. Fig. 3b and 3c are cutaway side view depictions of pole suspension 300 implemented to housing pole 102 and top pole 104 respectively. Fig. 4a is a perspective view of top assembly 400 comprising top pole 104 and pivotal top 110, where Fig. 4b is an exploded perspective view of top assembly 400 illustrating the elements of pivotal top 110 attached to top pole 104. Fig. 5 is an exploded perspective view of base lock 500. Figs. 6a, 6b and 6c are depictions of how to use the universal support suspension pole with barrier sheeting. Fig. 7a is a front view of the universal support suspension pole used with setting bricks. Fig. 7b is an oblique view of the universal support suspension pole used with a temporary wall. Figs. 1-5 illustrate one embodiment of a supportive suspension pole designated generally by reference number 100 in the figures, and where components 200, pole suspension 300, top assembly 400 and base lock 500 designate generally the reference numbers of the supportive suspension pole 100 elements.

[0039] Fig. 2 depicts components 200 comprising universal supportive suspension pole 100 of Fig. 1. Shown are the elements of pole suspension 300 comprising top barbed cylinder 226, bottom barbed cylinder 236, rivets 278, compression spring 220, housing pole 102 having outside diameter 202 and inside diameter 212, top pole 104 having outside diameter 204 and inside diameter 208, and base pole 106 having outside diameter 206 and inside diameter 210, where the respective base pole 106 diameters are similar to the top pole 104 diameters.

[0040] Compression spring 220 is depicted having outside coil diameter 224 similar to but smaller than top pole inside diameter 208 to enable slidable fit inside

top pole 104 and inside housing pole 102. Compression spring 220 is further depicted having inside coil diameter 222 that enables the spring coils to firmly warp around the barbs of top barbed cylinder 226 and bottom barbed cylinder 236, where top barbed cylinder 226 and bottom barbed cylinder 236, are inserted into opposite ends of compression spring 220. Top barbed cylinder 226 and bottom barbed cylinder 236 are depicted having hollow centers and open ends. Top barbed cylinder 226 is further depicted having generally a top half 230 and bottom half 232 of similar and opposite features separated by top barbed cylinder shoulder 234. Top barbed cylinder hole 228 is placed in the top half 230 of top barbed cylinder 226 for accepting rivet 278. The diameter of top barbed cylinder 226 is similar to but less than top pole inside diameter 208 to enable easy insertion into top pole 104. Further, bottom barbed cylinder 236 is depicted having generally a top half 240 having similar diameter to top barbed cylinder 226, and a larger diameter bottom half 242 separated by bottom barbed cylinder shoulder 244, where the diameter of the bottom half of bottom barbed cylinder 236 is similar to but less than the housing pole inside diameter 210 to enable easy insertion into housing pole 102. Bottom barbed cylinder 236 is depicted having bottom barbed cylinder hole 238 placed in the larger diameter bottom half 242 for accepting rivet 278. Top barbed cylinder 226 and bottom barbed cylinder 236 are fastened to top pole 104 and bottom pole 102, respectively, using rivet 278 inserted through top barbed cylinder hole 228 and using rivet 278 inserted through bottom barbed cylinder hole 238 as will be made more clear in discussing Figs. 3a, 3b, and 3c.

[0041] In Fig. 2, housing pole 102, top pole 104 and base pole 106 are depicted in sectional perspective views, where housing pole 102 is depicted as having a top section cutaway and a bottom section cutaway. Top pole outside diameter 204 is smaller than housing pole inside diameter 210, where top pole 104 is slideably fit

through dust guard 214 and inside housing pole 102. In operation, dust guard 214 having a top inside diameter (not shown), enables top pole 104 to freely slide through, yet prevents dust from accumulating inside housing pole 102, and has a bottom inside diameter 215 that tightly friction-fits onto housing pole 102 enabling dust guard 214 to be fixedly mounted to housing pole 102. Similarly, base pole outside diameter 206 is smaller than housing pole inside diameter 212, where base pole is slidably fit into housing pole 102. Base pole 106 is shown having limiter ridge 216 with an outside diameter smaller than housing pole inside diameter 202 and an outside diameter larger than base pole outside diameter 206. Extension limiter 218 has an inside diameter that firmly friction-fits onto housing pole 102, and a bottom extension limiter inside diameter (not shown) that allows base pole 106 to freely slide through until limiter ridge 216 engages extension limiter bottom inside diameter, where limiter ridge 216 outside diameter is larger than extension limiter 218 inside diameter and unable to pass through, thus limiting the distance that base pole 108 can slide out from housing pole 102.

[0042] Further depicted in Fig. 2, are the elements of top assembly 400 comprising top insert 246 having insert base 248, top insert male thread 250 and top insert shoulder 252. Pivot base 254 is depicted having pivot base threads 256 for accepting top insert male threads 250 and pivot base bearing hole 258 for accepting pivot pin 260. Further depicted is pivot hinge 262 having pivot hinge press-fit hole 264 for accepting pivot pin 260, pivot base plate 266 having pivot base plate post 270 for operatively engaging pivot hinge 262. Pivot base plate 266 further comprises pivot base plate clip channel 268 for accepting pivot top plate clip 276 of pivot top plate 274. Pivot base plate 266 further comprises pivot base plate receiving edge 272 where pivot top plate clip 276 hooks for fastening. In assembly practice, pivot hinge 262 is placed around pivot plate post 270, then pivot top plate 274 is coupled

to pivot base plate 266 by inserting pivot top plate clips 276 into pivot base plate clip channels 268 for coupling operation, thus enabling pivot base plate 266 to freely rotate about pivot base plate post 270. Pivot base bearing hole 258 is aligned concentrically and between pivot hinge press-fit holes 264 so as to allow pivot pin 260 to insert through pivot hinge press-fit holes 264 and pivot base bearing hole 258, where pivot pin 260 firmly friction fits to pivot hinge press-fit holes 264 and loosely fits pivot base bearing hole 258 enabling pivot hinge 262 to freely rotate about pivot pin 260.

[0043] Further, depicted in Fig. 2 are base lock 500 elements of components 200 comprising housing pole 102, base pole 104, lock insert 280 and lock ring 236. Lock insert 280 is depicted as having lock insert base 282, lock insert shoulder 284, lock insert cam 286 and lock insert top 288, and lock ring 290 having an asymmetric cutout having a thinner wall and a thicker wall creating lock ring cam 292, where lock ring cam 292 is oversized to enable a loose-fit when placed around lock insert cam 286. Lock ring cam 290 is made from pliable material and is split to enable placement around lock insert cam 286.

[0044] Further depicted in Fig. 2 is base foot 294 having an open top and closed bottom. Base foot inside diameter sized to enable a friction fit onto base pole 106. Base foot 294 is selectively weighted to enable gravity to pull base pole 106 away from housing pole 102 when base foot 294 is placed below a horizontal position and base lock is placed in an “unlocked” position. The operative combination of components 200 and how they are combined are further depicted in Figs. 3a, 3b, 3c, 3d and Fig 4a, 4b, and Fig.5.

[0045] Figs. 3-5 depict components 200 and their operative relationships of pole suspension 300, top assembly 400 and base lock 500. Referring now to Figs. 3a, 3b and 3c, depicted is pole suspension 300 of the universal supportive suspension pole

100, while Fig. 3d depicts an alternate embodiment of a barbed insert 306. Fig. 3a depicts an exploded perspective view of the elements of components 200 comprising pole suspension 300. Pole suspension 300 is enabled by coiling a first end of compression spring 220 around the bottom half 232 (see Fig. 2) of top barbed cylinder 226 and coiling a second end of compression spring 220 around the top half 240 (see Fig. 2) of bottom barbed cylinder 236. Top barbed cylinder 226 and compression spring 220 are inserted into top pole 104 and fixed thereto by inserting a rivet 278 through top pole rivet hole 302 and top barbed cylinder hole 228 then applying riveting means as is customary in the art. Similarly, bottom barbed cylinder 236 and compression spring 220 are then inserted into housing pole 102 and fixed thereto by inserting and fastening rivet 278 through housing pole rivet hole 304 and bottom barbed cylinder hole 238 then applying riveting means as is customary in the art.

[0046] Compression spring 220 is assembled to top barbed cylinder 226 by aligning compression spring 220 central axis with top barbed cylinder 226 bottom half 233 (see Fig. 2) central axis and applying pressure to force the two components together then rotating top barbed cylinder 226 in a direction opposite to compression spring 220 coil wrap direction, enabling compression spring 220 to snap along top barbed cylinder 226 bottom half 232 (see Fig. 2) towards top barbed cylinder shoulder 234. Assembling compression spring 220 to bottom barbed cylinder 236 is done by aligning compression spring 220 central axis with bottom barbed cylinder 236 top half 236 (see Fig. 2) central axis and applying pressure to force the two components together then rotating bottom barbed cylinder 236 in a direction opposite to compression spring 220 coil wrap direction, enabling compression spring 220 to snap along bottom barbed cylinder 236 top half 240 (see Fig. 2) towards bottom barbed cylinder shoulder 244.

[0047] Further depicted in Fig. 3a, top barbed cylinder 226 top half 230 (see Fig. 2) includes hole 228 perpendicular to the cylinder center axis for accepting rivet 278. Similarly, bottom barbed cylinder 236 bottom half 242 (see Fig. 2) includes hole 238 perpendicular to the cylinder center axis for accepting rivet 278. Top barbed cylinder hole 228 is aligned with top pole rivet hole 302 and rivet 278 is inserted and fixed there to. Bottom barbed cylinder hole 238 is aligned with housing pole rivet hole 304 and rivet 278 is inserted and fixed thereto. Further depicted is dust cover 214 positioned collinear and ready for assembling to housing pole 102.

[0048] Fig. 3b depicts a side view of the pole suspension 300 cutaway in the housing pole 102 near the rivet 278 interface, where shown is compression spring 220 having spring coils wrapped about bottom barbed cylinder 236 top-half 240 (see Fig. 2). As is depicted, rivet 278 is inserted trough housing rivet pole hole 302 (see Fig. 3a) and through bottom barbed cylinder hole 238 and fastened using standard riveting practice.

[0049] Fig. 3c depicts a side view of the pole suspension 300 cut away near the housing pole 102 and dust cover 214 interface, where shown is compression spring 220, having spring coils friction fitted onto top barbed cylinder 226 bottom half 232 (see Fig. 2), and where the coils are fitted over the cylinder barbs. Rivet 278 is inserted through top pole rivet hole 304 (see Fig. 3a) and through top barbed cylinder hole 228 then fastened using standard riveting practice. Further depicted is top pole 104 inserted into dust guard 214 and housing pole 102 having dust guard 214 attached thereto. Figs. 3a, 3b, and 3c illustrate the assembled elements of the pole suspension 300 where top pole 104 slides inside housing pole 102 and operates under spring action.

[0050] Fig. 3d depicts an alternate embodiment of a barbed insert 314. As shown, barbed insert 314 is hollow with a cylindrical base 310, a barbed upper

cylinder 308, and rivet hole 312. Cylinder base 310 is depicted with an outside diameter suitable for inserting to top pole 104 (not shown), a larger outside diameter (not shown) is suitable for inserting into housing pole 102 (not shown).

[0051] Referring to Figs. 4a and 4b, depicted are perspective views of top assembly 400 comprised of pivotal top 110 and top pole 104, where Fig. 4b is an exploded perspective view of Fig. 4a. Fig. 4a depicts top pole 104 having top pole rivet hole 302 for receiving rivet 278 as described earlier and illustrated in Figs. 3a and 3c and top pole crimp 402 for holding top insert base 248 of top insert 246 to top pole 104. Fig. 4b depicts an exploded perspective view of top pole 104 and pivotal top 110 of Fig 4a. Top insert 246 is press-fit into top pole 104 until top insert shoulder 252 abuts the top end of top pole 104, where top insert base 248 is oversized to create a friction fit with top pole inside diameter 208. Top pole 104 is crimped at top pole crimp 402 to fixedly fasten top insert 246 to top pole 104. Top insert male thread 250 screws into pivot base threads 256 of pivot base 254 to fixedly fasten pivot base 254 to top insert 246. Pivot hinge 262 operatively couples with pivot base plate post 270 of pivot base plate 266. Pivot hinge press-fit holes 264 are concentrically aligned with pivot base bearing hole 258, where pivot pin 260 is inserted to pivot base bearing hole 258 and press fit into pivot hinge press-fit holes 264 to enable hinge action in both pitch and roll directions of pivot base plate 266 as depicted in fig 4a. Pivot base plate clip channel 268 of pivot base plate 266 receives pivot top plate clip 276 of pivot top plate 268 and is secured by a hook feature of pivot top plate clip 276.

[0052] Fig. 5 depicts an exploded perspective view of base lock 500 comprising lock insert 280 having lock insert base 282, lock insert shoulder 284, and lock insert cam 286, and lock insert top 288 where lock insert base 282 inserts to base pole 106 until lock insert shoulder 284 abuts base pole 106 end, and where lock insert base

282 has a diameter so as to create a strong friction fit with base pole 106. Base pole 106 has base pole crimp 502 to fixedly fasten lock insert 280 to base pole 106. Further, lock ring 290 having lock ring cam 292 loosely encompasses lock insert cam 286 of lock insert 280. Lock grip 218, a generally hollow cylinder having one end fixedly attached to the bottom end of housing pole 102 and having the other end sized to allow base pole 106 to freely slide through. By securely holding lock grip 218 and manually rotating base pole 106 about its center axis, lock insert cam 234 acts on lock ring cam 238 of lock ring 236 forcing lock ring 236 toward and away from the inner wall of housing pole 102 to selective lock and unlock base pole 106 in place.

[0053] Figs. 6a, 6b, and 6c depict universal support suspension pole 100 used to create a debris barrier 600. Fig. 6a, is a perspective view of two universal support suspension poles 100 having pivot tops 110 compressed against ceiling 604, where top pole 104 is pressed into housing 102 and compressing compression spring 220. Here base pole 106 is locked in place with housing pole 102 using base lock 500. The compression spring 220 forces pivotal top 110 away from base foot 108, thus suspending protective barrier sheeting 602 placed in front of a doorway 606, where pivotal top 110 has barrier sheeting 602 fixed between pivotal base plate 266 and pivotal top plate 274. Universal support suspension pole 100 spans from the ceiling 604 to the floor (not shown to remove visual obstruction). Base foot 108 is placed onto barrier sheeting 602 to hold it firmly against the floor (not shown).

[0054] Fig. 6b is a perspective view of Fig 6a without ceiling 604 and doorway 606 to further illustrate the interface of universal support suspension pole 100 and barrier sheeting 602. As shown, base foot 108 rests on the bottom edge of barrier sheeting 602 to hold the end firmly on the floor (not shown), and pivotal top 110 fixedly grasps barrier sheeting 602.

[0055] Fig. 6c depicts a partially exploded, perspective view of the interface between barrier sheeting 602 and pivot top 110. As illustrated, barrier sheeting 602 is placed between pivot base plate 266 and pivot top plate 274. Barrier sheeting 602 is mounted between pivot plate top 274 and pivot plate bottom 266 by opening the assembly by depressing pivot top plate clips 276 inward and removing pivot plate top 274 from pivot base plate 266. Barrier sheeting 602 is inserted between pivot plate top 274 and pivot plate bottom 266 then pivot top plate 274 is pressed onto pivot base plate 266, where pivot top plate clips 276 pierce through barrier sheeting 602 and pivot top plate clips 276 insert to pivot base channels 286 and hook to pivot base plate receiving edge 272.

[0056] Fig. 7a depict universal support suspension pole 100 used to support bricks 704 as an adhesive (not shown) cures to bond bricks 704 to overhead 702. Universal support suspension pole 100 is installed by forcing pivot top 110 up beneath brick 704, and pointing housing pole 102 with base pole 106 downward to the floor (not shown). Base lock 500 is released to allow base pole to fall freely to the floor (not shown), where base foot 108 is sufficiently weighted to pull base pole 108 downward. When base foot 108 is resting on the floor (not shown), base lock 500 is actuated to hold base pole 106 in a fixed position to enable universal support suspension pole to support brick 704.

[0057] Fig. 7b depicts a universal support suspension pole 100 supporting a temporary wall 708 placed across door trim 706, where the door (not shown) has been removed for service.

[0058] Fig.'s 8, 9 and 10 generally depict the suspension pole manufacturing processes using plastic tubular inserts in the compression spring.

[0059] Referring now to Fig.'s 8a and 8b where depicted is the suspension subassembly manufacturing process 800. Fig. 8a depicts a perspective view of an

insert tube spool 802 for creating insert tubes to be inserted into the compression spring 220. As depicted, the compression spring 220 is rotated about its longitudinal center axis 804 in a direction that induces the compression spring to expand around the compression spring spool 802, generally the direction is in the coil direction 806. The tube spool having a cleaved angle between 10 and 30 degrees end 808 is inserted into the rotating compression spring 220 about 2 inches then cleaved at an angle between 10 and 30 degrees using a cutting blade 810. Fig. 8b depicts the cleave angle 812 made by the cutting blade 810 and the tube spool 802. Further depicted in Fig.'s 8a and 8b is the first tubular insert 814 already inserted into the first end of compression spring 220, where the second tubular insert is made when the tube spool 802 is cleaved near the second end of the compression spring and at the cleave angle 812.

[0060] Fig.'s 9a, 9b, 9c, 9d, and 9e depict the suspension assembly steps 900. Fig. 9a depicts the suspension subassembly 902 having a first tubular insert 814 and a second tubular insert in each end of the compression spring 220. Fig. 9b depicts the first tube insert 814 of the suspension subassembly positioned about 2 inches into the top pole 104 for drilling a hole, positioned about 1 and a half inches from the top pole first end, through one wall of the top pole 104 and through one wall of the first tube insert 814, where the drill creates a hole positioned between two coils (not shown) of the compression spring 220. Fig. 9c depicts the first tube insert 814 of the suspension subassembly 902 positioned about 2 inches into the top pole 104 with a first rivet 908 secured in the hole drilled, as depicted in Fig. 9b, where the first rivet 908 frictionally fits between two coil winds (not shown) of the compression spring 220, and fixedly fastens the first tube insert 814 to the housing pole 104. Fig. 9d depicts the second tube insert 904 of the suspension subassembly positioned and fixedly held about 10 inches into the housing tube 102 for drilling a hole through one

wall of the housing pole 102 and through one wall of the second tube insert 904, where the drill creates a hole in the second insert tube 904 positioned about 9 and a half inches from the housing pole 102 second end and between two coils (not shown) of the compression spring 220. Fig. 9e depicts the second tube insert 904 of the suspension subassembly 902 positioned about 10 inches into the housing pole 102 with a second rivet 910 secured in the hole drilled, as depicted in Fig. 9d, where the second rivet 910 frictionally fits between two coil winds (not shown) of the compression spring 220, and fixedly fastens the second tube insert 904 to the housing pole 102.

[0061] Fig.'s 10a, 10b, 10c and 10d further depict end views 1000 of the suspension assembly steps 900, where Fig. 10a and 10b depict a front-end view of the top pole 104 being assembled to a suspension spring sub-assembly. Fig. 10a depicts the drill 906 drilling a hole through the concentric center of the top pole 104, compression spring 220 and first tube insert 814. Fig 10b depicts the first rivet 908 fixedly fastening the first tube insert 814 to the top pole 104, where the first rivet 908 frictionally fits between two coil winds (not shown) of the compression spring 220.

[0062] Fig. 10c and 10d depict back-end views of the housing pole 102 being assembled to the suspension spring sub-assembly. Fig. 10c depicts the drill 906 drilling a hole through to the concentric center of the housing pole 102, compression spring 220 and second tube insert 904. Fig 10c depicts the second rivet 910 fixedly fastening the second tube insert 904 to the housing pole 102, where the second rivet 910 frictionally fits between two coil winds (not shown) of the compression spring 220. Further, in Fig. 10d the second rivet 910 is depicted in the foreground and the first rivet 908 is depicted in the background and inside the housing pole 104.